DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

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April 13, 1988

Mr. Joseph C. Milbourne
North Lilly Mining Company
851 Traeger Street Suite 320
San Bruno, California 94066

Re: Tintic Project
Construction Permit

Dear Mr. Milbourne:

We have reviewed the revised plans and specifications for the Tintic heap leach project submitted to us by your engineers, Steffen Robertson and Kirsten Consulting Engineers.

The plans and specifications comply with the requirements for a heap leach facility at Silver city, Utah and a construction permit is hereby issued as constituted by this letter subject to the following conditions. This permit allows the use of the completed facilities until 1/1/95.

1. A leakage contingency plan must be developed for the Tintic project, and submitted to the Bureau of Water Pollution Control for review and approval prior to initiating operations. The plan must include the following leakage notification criteria:
    a. 0-5 gallons per day (gpd) - Record volumes in log book and report to the Bureau of Water Pollution Control (BWPC) by phone within 24 hours, if leakage is detected.

    b. 5-50 gpd - Record volumes and sample for pH and cyanide (CN-). Report findings to the BWPC by phone within 24 hours and in writing within seven (7) days.

    c. 50-500 gpd - Reduce application rates. Report to the BWPC by phone within 24 hours and in writing within seven (7) days. Daily monitoring of leakage will be required with a monthly report being submitted to the BWPC.

    d. Greater than 500 gpd - Discontinue use of that portion of the pad and provide to BWPC within seven (7) days a description of the portion of the pad not being leached.

2. An operations and maintenance plan for the heap leach pad and the process ponds including a schedule for daily monitoring of the leak detection sump must be submitted for review and approval prior to initiating operations.

3. Appropriate inspections must be scheduled with the Bureau of Water Pollution Control not less than three (3) days before commencing the following activities:

   a. Construction of the leak detection system
   b. Construction of the secondary clay liner
   c. Field seaming of the flexible membrane liner.

4. The Bureau of Water Pollution Control must be notified at least five (5) days before completion of process ponds and heap leach pad field seaming work so an inspection can be scheduled before any loading of these liners occurs.

5. The Bureau of Water Pollution Control must be notified in writing within seven (7) days of the completion of leaching operation authorized and described by this permit.

6. The leaching facilities will be neutralized, and decommissioned during the construction season following completion of leaching operations as described in the approved closure document. This closure document must be submitted to the BWPC in an approvable form within 30 days of the receipt of this permit and must contain the following items as the minimum:

   a. Neutralization criteria and closure procedures as outlined in Attachment A of this letter.

   b. Neutralized ore shall be reclaimed on the heap leach pad liner.

   c. Slimes, solids and precipitants on the process pond liners shall be neutralized according to the criteria in Attachment A #I and disposed of in an approved site before the liner is disposed of.

   d. A fence with appropriate signs shall be maintained around the reclaimed heap leach pile for at least four (4) years after the pile is decommissioned.

7. Only liner material compatible chemical constituents will be allowed in the process liquids.

8. The maximum leaching solution application rate and the maximum allowable process fluid head on the flexible membrane must be specified in the operations and maintenance plan. Also the maximum operating head on the flexible membrane liner must be monitored on a daily basis for the first 30 days, and weekly thereafter. This information must be submitted to the Bureau of Water Pollution Control quarterly during the life of the project.

9. The construction quality assurance verification of each secondary liner lift must be reviewed by the Bureau of Water Pollution Control before the construction of the next secondary liner lift may commence.

10. The Tintic project production well shall be sampled for total and free cyanide, Total dissolved solids, copper, and arsenic every 3 months beginning 6 months after the initiation of operations.

11. The construction of a 2,050,000-gallon Process Water Surge Pond may be delayed under the following conditions:

    a. Approvable plans and specifications for the Surge Pond shall be received by this Bureau no later than 1 July 1988.

    b. The Surge Pond must be designed and constructed to meet or exceed all the requirements for process ponds as shown in the approved plans and specifications covered by this construction permit.

    c. The Surge Pond shall be constructed, and be operational by 31 August 1988.

12. Per phone conversation with Mr. Milbourne on 12 April 1988 the following has been agreed upon:

    a. Eight (8) triaxial permeability tests will be conducted per lift of the secondary clay liner to verify that the 1.0×10^{-7} cm per second maximum rate has been achieved.

    b. A lined and bermed containment pond will be constructed to contain 1.5 times the volume of the acid storage tank before initiation of operations or the storage of acid in the tank, whichever occurs first.

    c. All process piping will be routed inside the lined areas of the leach pad and process ponds such that any leakage or spillage will be contained in a lined area.

    d. The first ore which will be placed on the flexible membrane will be eight (8) foot thick and dozed on from a ramp along the edge of the pad.

    e. All leak detection sumps will be accessed by a four (4) inch diameter casing and accessible for a Brainard-killan positive displacement sampling pump. Standby power will be available on site.

13. All clay materials which will be used to construct the secondary clay liner must meet the following specifications:

    a. Thirty six (36) per cent minimum passing the number 200 sieve.

    b. One hundred (100) per cent passing the 1/2 inch screen.

This construction permit authorizes commencement of construction of the Tintic project facilities described hereinafter, which must be substantially under construction within one (1) year of the date of this permit. Otherwise, resubmittal and reissuance of the construction permit will be required.

The Tintic project facilities covered by this permit consist of a cyanide heap leach pad ten (10) acres in size (approximately 600 feet by 600 feet) and a maximum height of approximate 35 feet.

The liner system for the heap leach pad shall consist of commencing at the top:

(1) Process solution collection system consisting of ore and piping which will limit the process fluid head on the flexible membrane liner to twelve (12) inches or less. A system for monitoring the head shall also be provided.

(2) Primary liner consisting of a 40 mil PVC flexible membrane with a PVC-OR (polyvinyl chloride - oil resistant) edge were exposed to sunlight constructed according to the quality assurance requirements as outlined in the approved specifications.

(3) Secondary clay liner, must be twelve (12) inches thick, laid in two (2) lifts, have a permeability not exceeding 1.0×10^{-7} cm/sec., and meeting the quality assurance requirements as specified in the approved specifications.

(4) Leakage detection system which will convey leakage at a minimum head to a leak detection sump.

(5) Prepared base for the system with a hydraulic conductivity differential with a leakage detection system of not less than 3 orders of magnitude difference.

The barren solution pond and the pregnant solution pond liner systems shall consist of commencing of the top:

(1) Primary liner consisting of a 40 mil PVC-OR flexible membrane

(2) a. geotextile material on side slopes
b. drainage mat on pond bottom.

(3) Secondary liner consisting of a 30 mil PVC flexible membrane.

(4) A substantial foundation material capable of adequately supporting the liner system.

We are advising you that any increase in pH, lead, cadmium, or cyanide in ground water or surface water above background level due to this project may cause the project to be listed on the national priority list of hazardous substance sites by EPA pursuant to the Comprehensive Environmental Response Compensation Liability Act (CERCLA).

All wastes not exempt under the mining exemption will need to be managed in accordance with Utah's Hazardous Waste management Regulations (i.e. spent solvents, off specification acids and chemicals, and undesirable metals in the leach solutions, etc.).

Finally, the domestic wastewater facilities for the project must be approved by the Central Utah District Health Department.

By copy of this letter to the Division of Oil, Gas and Mining, we are requesting that the State mine inspector visit this mine site at least twice per year and inspect the leak detection sumps for these facilities.

Please call Mr. Mack Croft or Mr. Charlie Dietz of our staff at 538-6146 if there are any questions.

Sincerely,
Utah Water Pollution Control Committee

for Don A. Ostler, P.E.
Executive Secretary

CD/cw/ag
3845y-7

cc: Mr. Don Poulter, Steffen, Robertson & Kirsten
Mr. Roger Foisy, State Health Department, Richfield
Mr. Wayne Hedburg, Oil, Gas and Mining
Mr. Bruce Hall, Central Utah District Health Department
Bureau of Solid and Hazardous Waste

ATTACHMENT A

I. Heap leach drainage neutralization criteria:

a. pH of 6.5 to 7.5

b. Weak acid dissociable (WAD) cyanides less than or equal to 0.20 mg/l.

c. Total cyanide less than or equal to 0.75 mg/l.

d. Metals content shall meet drinking water standards or surface water quality standards which ever is lower.

II. Neutralized heap leach spent ore verification procedures.
The following procedures shall be used to determine whether free cyanide (CN^-) in the spent ore has been neutralized to a satisfactory level.

a. A sampling grid of the neutralized spent ore pile shall be submitted to the Bureau of Water Pollution Control for review and approval. The sampling grid shall contain a minimum of ten (10) Sampling locations.

b. The sample to be analyzed from each sampling location shall contain 100 grams as an aliquot of samples taken as set forth below, except that no sample shall be taken within three (3) feet above the flexible membrane liner unless special provisions are made to avoid penetrating the liner or for sealing said penetrations:

1. An ore pile 30 feet or less in depth shall have samples taken at 25, 50, and 75 percent of the depth.

2. An ore pile greater than 30 feet in depth shall have samples taken every ten (10) feet of depth.

c. The maximum allowable free cyanide (CN^-) shall not exceed the following levels in the filtrate portion of a 5/1 extraction.

1. 90 Percent of a least 10 samples shall contain less than 10 mg/l free cyanide (CN^-) in the filtrate.

2. None of the samples shall contain more than 20 mg/l free cyanide (CN^-) in the filtrate.

d. For any sampling location that indicates a free cyanide level in excess of 20 mg/l in the filtrate, the aerial extent of the inadequately detoxified area shall be determined and detoxified so that the cyanide levels in that particular ore pile will comply with the limitations described herein.